



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

HA

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,759	03/26/2004	Jiong-Ping Lu	TI 37793	9075

23494 7590 10/25/2006

TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS, TX 75265

EXAMINER
----------

LUU, CHUONG A

ART UNIT	PAPER NUMBER
----------	--------------

2818

DATE MAILED: 10/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/810,759

Applicant(s)

LU ET AL.

Examiner

Chuong A. Luu

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-10 and 12-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-10 and 12-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 3-10 and 12-20 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

Claim 20 is objected to because of the following informalities: Claim 20 depends on claim 11, which is canceled. Appropriate correction is required.

## **PRIOR ART REJECTIONS**

### **Statutory Basis**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### **The Rejections**

Claims 1, 3, 4-5, 7-8, 10, 12-14 and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Yu (U.S. 6,376,320 B1).

Yu discloses a semiconductor device with

(1) forming a polysilicon gate electrode (216) over a substrate (204) (see Figure 2);

forming source/drain regions (232, 234) in said substrate (204) proximate said polysilicon gate electrode (216) (see Figure 5);

forming a blocking layer (236) over said source/drain regions (232, 234) in a step, said blocking layer comprising a metal silicide (see column 6, lines 6-23. Figures 6-7);

siliciding said polysilicon gate electrode (216) to form a silicided gate electrode (250) (see column 7, lines 48-60. Figure 12);

(3); (12) wherein said blocking layer is a silicided source/drain contact region (see column 6, lines 6-23. Figures 6-7);

(4); (13) wherein said silicided gate electrode comprises a different metal silicide than said blocking layer (see column 8, lines 23-38);

(5); (14) wherein said blocking layer comprises a cobalt silicide and said silicided gate electrode comprises a nickel silicide (see column 8, lines 23-38);

(7); (16) further including forming a protective layer (212) over said polysilicon gate electrode (216) prior to said forming a blocking layer over said source/drain regions (232, 234) (see Figures 2-5);

(8); (17) wherein said protective layer is a silicon nitride protective layer (see column 4, lines 40-42);

(10) forming a polysilicon gate electrode (216) over a substrate (204) (see Figure 2);

forming source/drain regions (232, 234) in said substrate (204) proximate said polysilicon gate electrode (216) (see Figure 5);

forming a blocking layer (236) over said source/drain regions (232, 234) in a step, said blocking layer comprising a metal silicide (see column 6, lines 6-23. Figures 6-7);

siliciding said polysilicon gate electrode (216) to form a silicided gate electrode (250) (see column 7, lines 48-60. Figure 12);

forming interconnects within dielectric layers located over said substrate for electrically contacting said semiconductor devices (see Figure 12).

## **PRIOR ART REJECTIONS**

### **Statutory Basis**

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### **The Rejections**

Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu (U.S. 6,376,320 B1) in view of Erhardt et al. (U.S. 6,514,859 B1).

Yu teaches the above outlined features except for herein siliciding said polysilicon gate electrode to form a silicided gate electrode includes fully siliciding said polysilicon gate electrode to form a fully silicided gate electrode. However, Erhardt discloses a semiconductor device with **(9); (18)** wherein siliciding said polysilicon gate electrode to form a silicided gate electrode includes fully siliciding said polysilicon gate electrode to form a fully silicided gate electrode (see column 5, lines 36-49. Figure 9). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the MOS transistors of Yu (accordance with the teaching of Erhardt). Doing so would facilitate the manufacture of the semiconductor MOS transistor and enhance the performance of the semiconductor device.

Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu (U.S. 6,376,320 B1) in view of Wieczorek et al. (U.S. 6,423,634 B1).

Yu teaches everything above except for having the specific thickness of the blocking layer ranging from about 10 nm to about 35 nm. However, Wieczorek discloses a semiconductor device **(6); (15)** wherein said blocking layer has a thickness ranging from about 15nm to about 75nm (10 nm to about 35 nm) (see column 5, lines 3-5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the MOS transistors of Yu (accordance with the teaching of Wieczorek) and it also has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art and it is noted that the applicant does not disclose criticality in

Art Unit: 2818

the ranges claimed. In re Aller, 105 USPQ 233 (see MPEP j 2144.05). Doing so would facilitate the manufacture of the semiconductor MOS transistor and increase the speed of the semiconductor device.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A. Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Chuong Anh Luu  
Patent Examiner  
October 18, 2006